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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

NICOLAS, WESLEY A

ART UNIT PAPER NUMBER

1742

DATE MAILED: 11/13/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

C70 6

**Office Action Summary**

Application No.

09/682,377

Applicant(s)

BARBER ET AL.

Examiner

Wesley A. Nicolas

Art Unit

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-- **The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 September 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7,9,10,12,13 and 15-34 is/are pending in the application.
- 4a) Of the above claim(s) 17-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7,9,10,12,13,15,16,33 and 34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☒ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other:

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### DETAILED ACTION

This is in response to the Amendment submitted September 5, 2003. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-7, 9-10, 12-13, and 15-34 are currently pending in this application, with claims 17-32 withdrawn from consideration as being drawn to a non-elected invention.

#### Election/Restriction

1. Claims 17-32 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 5.

Applicant has provided no meaningful argument other than that if a generic claim is finally held to be allowable, the non-elected claims should be re-considered by Examiner. However, this argument is not convincing because in the Amendment of Paper # 5, submitted September 5, 2003, Applicant further deviated Groups I and II by amending the process claims to add a process step. Additionally, since Applicant has not provided express admission that the claimed inventions are indistinct as required by Lee, the restriction as set forth in the previous Office action has been maintained. In re Lee, 199 USPQ 108 (Deputy Asst. Comm'r. for Pats 1978). The restriction requirement is therefore deemed **FINAL**.

**Claim Rejections - 35 USC § 102**

2. Claims 1-4, 6-7, 14-16, and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen (U.S. 6,197,181 B1).

The rejection of claims 1-4, 6-7, 14-16, and 33 as set forth in the previous Office action has been **withdrawn** in view of Applicant's amendment and argument, and further in favor of a new rejection which is set forth below.

3. Claims 1-4, 6, 8-10, 12-16, and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Matsunaga et al. (6,118,280).

The rejection of claims 1-4, 6, 8-10, 12-16, and 33 as set forth in the previous Office action has been **withdrawn** in view of Applicant's amendment and argument, and further in favor of a new rejection which is set forth below.

**Claim Rejections - 35 USC § 103**

4. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsunaga et al. (6,118,280) as applied to claims 1 and 8 above.

The rejection of claims 5 and 11 as set forth in the previous Office action has been **withdrawn** in view of Applicant's amendment and argument, and further in favor of a new rejection which is set forth below.

**New Rejection - 35 U.S.C. § 103**

5. Claims 1-4, 6-7, 15-16, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. 6,197,181 B1), and further in view of Phillippe et al. (4,221,832).

Chen teaches a method comprising:

- (a) providing a plating solution on the surface of the substrate (col. 5, lines 34-40),
- (b) electroplating or electrolysis plating the metal or alloy on the surface of the substrate (col. 5, lines 34-40), and
- (c) introducing a stabilizing agent comprising an acid (col. 5, lines 41-51: "acid") which keeps metal or alloy ions in the plating solution (col. 5, lines 41-51: "complexing agents").

Chen fail to specifically teach the introduction of a second solution comprising a stabilizing agent.

Phillippe et al. teach of adding a complexing agent comprising an acid during the process to prevent particle precipitation (col. 2, lines 45-63: "add substances... complexing agent").

Claims 1 and 33 are rejected because it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified Chen to add a second solution as taught by Phillippe et al. because Phillippe et al. teach that complexing agents are added to the bath to prevent precipitated particles from forming in the plated layer (col. 2, lines 45-63) which would have made for a defect free layer.

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It should be noted that "complexing agent" and "stabilizing agent" are being considered the same thing, namely because they perform the same function, *i.e.* stabilizing metal or other ions in solution.

Claim 2 is rejected because Chen teaches that the stabilizing agent prevents formation of precipitated salts on the surface of the substrate (col. 5, lines 41-51: "prevent the precipitation of copper hydroxide").

Claim 3 is rejected because Chen teaches that said stabilizing agent comprises an aqueous solution of a complexing agent for the plating metals (col. 7, lines 58-60: "D.I. water").

Claim 4 is rejected because Chen teaches that said complexing agent comprises an organic compound (col. 5, lines 41-50: "EDTA").

Claim 6 is rejected because Chen teaches that the complexing agent for the plating metals comprises citrate or EDTA (col. 5, lines 51-50: "EDTA", and Table 1: "Citrate").

Claim 7 is rejected because Chen teaches that the complexing agent is present in the molar ratio of 1 to 4 (compared to copper sulfate which is in the range of 0.03 to 0.25 M) (col. 5, lines 34-50).

Claim 15 is rejected because Chen teaches that the stabilizing agent is contained in the plating solution (col. 5, lines 34-40).

Claim 16 is rejected because Chen teaches that the substrate comprises a semiconductor wafer (col. 7, line 52: "semiconductor wafers").

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6. Claims 1-6, 9-10, 12-13, 15-16, and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsunaga et al. (6,118,280), and further in view of Phillippe et al. (4,221,832).

Matsunaga et al. teach a method comprising:

- (a) providing a plating solution on the surface of the substrate (col. 7, lines 28-45),
- (b) electroplating or electrolysis plating the metal or alloy on the surface of the substrate (col. 12, lines 42-48), and
- (c) introducing a stabilizing agent comprising an acid which keeps metal or alloy ions in the plating solution (col. 7, line 46 to col. 8, line 8: "complexing agent" and "acid").

Matsunaga et al. fail to specifically teach the introduction of a second solution comprising a stabilizing agent.

Phillippe et al. teach of adding a complexing agent comprising an acid during the process to prevent particle precipitation (col. 2, lines 45-63: "add substances...complexing agent").

Claims 1 and 33 are rejected because it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified Matsunaga et al. to add a second solution as taught by Phillippe et al. because Phillippe et al. teach that complexing agents are added to the bath to prevent precipitated particles from forming in the plated layer (col. 2, lines 45-63) which would have made for a defect free layer.

Claim 2 is rejected because, although Matsunaga et al. fail to specifically teach that the stabilizing agent (*i.e.* complexing agent) prevents formation of precipitated salts

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on the surface of the substrate, similar processes can reasonably be expected to yield products which inherently have the same properties. In re Spada, 15 USPQ2d 1655 (CAFC 1990).

Claim 3 is rejected because Matsunaga et al. teach that said stabilizing agent comprises an aqueous solution of a complexing agent for the plating metals (col. 7, lines 55-61: "complexing agent").

Claim 4 is rejected because Matsunaga et al. teach that said complexing agent comprises an organic or inorganic compound (col. 7, lines 55-61: "ammonium ion... organic acids... chelating agents").

Claim 5 is rejected because Matsunaga teach that the complexing agent comprises a mixture of an organic acid (EDTA or organic acid: col. 7, lines 56-59), and an inorganic compound or an inorganic compound (ammonium ion or cyan ion: col. 7, lines 55-56).

Claim 6 is rejected because Matsunaga et al. teach that the complexing agent for the plating metals comprises EDTA (col. 7, line 58: "EDTA").

Claim 9 is rejected because Matsunaga et al. teach that the acid does not form a low-soluble salt with the plated metals (col. 7, line 66 to col. 8, line 1: "preferably used for accurately controlling the deposition and elution of the metal component").

Claim 10 is rejected because Matsunaga et al. teach that the acid comprises an inorganic compound (col. 7, lines 62-65: "hydrochloric acid, sulfuric acid").

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Claim 12 is rejected because Matsunaga et al. teach that the acid comprises an aqueous solution of hydrochloric acid (col. 7, lines 62-65: "aqueous solution...hydrochloric acid").

Claim 13 is rejected because Matsunaga et al. teach that the hydrochloric acid concentration is about 0.1 mol/kg (col. 14, line 40: "0.1N").

Claim 15 is rejected because Matsunaga et al. teach that the stabilizing agent is contained in the plating solution (col. 7, lines 55-65).

Claim 16 is rejected because Matsunaga et al. teach that the substrate comprises a semiconductor wafer (col. 1, lines 5-35: "semiconductor").

Claim 34 is rejected because the stabilizing agent comprises sulfuric acid and EDTA (col. 7, lines 46-65: "EDTA" and "sulfuric acid").

### **Response to Argument/Amendment**

7. Applicant's arguments with respect to claims 1-7, 9-10, 12-13, 15-16, and 33-34 have been considered, but are moot in view of the new ground(s) of rejection. Examiner will still address such arguments with regard to the new rejection.

With respect to the amendment of claims 1 and 33 regarding the use of a "second solution...comprising a stabilizing agent", Applicant asserts that Chen and Matsunaga et al. fail to teach such a solution. Examiner agrees that Chen and Matsunaga et al. fail to teach a second solution, however, Phillippe et al. was introduced by the Examiner to show that a second solution comprising a complexing agent (*i.e.* similar if not identical to a "stabilizing agent"), is used to prevent precipitates from

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forming in the deposited layer (col. 2, lines 54-60), the same reason Applicant relies on for the use of such a complexing/stabilizing agent. Accordingly, Applicant's amendment to the claim by selection of a known material based on its suitability for its intended use is prima facie obvious (see **MPEP 2144.07**).

With respect to the amendment of claims 3, 10, 12, and 13, their rejection is clearly set forth above and the amendments by Applicant do little if nothing to justify any change in position on the part of the Examiner.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "that the second solution is not relied on for the plating process", p. 6 of Applicant's response submitted September 5, 2003) are not recited in the rejected claim(s).

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988

F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Even if the second solution were not relied on for the plating process, Phillippe et al. teach that the second solution is merely an additive and can be added depending on the desired precipitation of the metal in solution (col. 2, lines 52-60).

With respect to the dependent claims, since Applicant has not argued the merits of Examiner's rejection of said dependent claims. As such, dependent claims whose merits are not separately argued from their independent claims stand or fall with it. In re Kulling, 14 USPQ2d 1056 (Fed. Cir. 1990).

***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

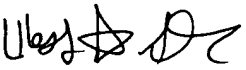
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley Nicolas whose telephone number is (703)305-0082. The examiner can normally be reached on Mon.-Thurs. from 7am to 5pm.

The Supervisory Primary Examiner for this Art Unit is Roy King whose telephone number is (703) 308-1146.

The fax number for this Group is (703) 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

  
**WESLEY A. NICOLAS**  
**PATENT EXAMINER**

November 9, 2003